



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re U.S. Patent Application of)

MIYAMOTO et al.)

Art Unit 2186

Application Number: 10/774,591)

Filed: February 10, 2004)

For: DISK ARRAY DEVICE)

ATTORNEY DOCKET NO. HITA.0515)

Honorable Assistant Commissioner
for Patents
Washington, D.C. 20231

COVER LETTER

Sir:

The below-identified communications are submitted in the above-captioned application or proceeding:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Petition to Make Special under 37 CFR §1.102(d) for Accelerated Examination | <input type="checkbox"/> Terminal Disclaimer |
| <input type="checkbox"/> Substitute Specification | <input checked="" type="checkbox"/> Information Disclosure Statement |
| <input type="checkbox"/> Assignment | <input checked="" type="checkbox"/> Statements & Pre-exam search report |

☐ Please charge my **Deposit Account Number** _____ in the amount of _____ to cover the fees for _____. A duplicate copy of this paper is enclosed.

☒ A check in the amount of **\$130.00** to cover the petition fee is enclosed.

☒ The Commissioner is hereby authorized to charge any additional fees associated with this Communication, or credit any overpayment to **Deposit Account Number 08-1480**.

Respectfully submitted,

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PETITION TO MAKE SPECIAL UNDER 37 C.F.R. § 1.102(d)
FOR ACCELERATED EXAMINATION

130.00 OF:



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STATEMENTS & PRE-EXAMINATION SEARCH REPORT
SUPPLEMENTAL TO
THE PETITION TO MAKE SPECIAL

Sir:

Pursuant to 37 C.F.R. §§ 1.102 and MPEP 708.02 VIII, Applicant hereby submits that (1) all claims of record are directed to a single invention, or if the Office determines that all the claims presented are not obviously directed to a single invention, will make an election without traverse as a prerequisite to the grant of special status; (2) a pre-examination search has been conducted according to the following field of search; (3) copies of each reference deemed most closely related to the subject matter encompassed by the claims are enclosed; and (4) a detailed discussion of the references pointing out how the claimed subject matter is patentable over the references is also enclosed herewith.

FIELD OF THE SEARCH

The field of search covered Class 361, subclasses 680, 684, 685, 686, 687, 694 and 695 and Class 454, subclass 185 (U.S. & Foreign). Additionally, a computer database search was conducted on the U.S.P.T.O. systems EAST and WEST for U.S. and foreign patents; a keyword search was conducted in Class 361 and Class 711 and a literature search was also conducted on the internet and commercial databases for relevant non-patent documents.

Examiner Lisa Lea-Edmonds in Class 361 (Group Art Unit 2835) was consulted in confirming the field of search.

The search was directed towards a disk array device. In particular, the search was directed towards claims 1-20 of U.S. Application No. 10/774,591. With reference to the disclosure, a disk array storage device is arranged such that a notebook type PC requiring a lower operation temperature may be used as an output computer with adequate ventilation. FIGS. 1 and 8 illustrates a perspective view of disk array box body 2 having a notebook type PC 14, management processor 13, and disk drive box bodies 4A, 4B. See pg. 18, second full paragraph. The processor and computer are arranged within a disk array box body in positions for uninhibited flow of a ventilating wind within the disk array box body. See pg. 19, first full paragraph. When the computer is used, the disk array device is set to a mode in which the computer is pulled out of the disk array box body, further rotated and used. See pg. 20, first full paragraph. With reference to the claims, a disk array device includes a disk array box, a controller, a processor for management, and a computer for output, wherein the processor for management is arranged on a side face of a controller box and does not prevent ventilation between plural disk drives, and a computer for output may optionally rotate with respect to the disk array box. (See Conclusion paragraph for detailed references to drawings and specification).

LIST OF RELEVANT REFERENCES

The search revealed the following U.S. patents, which are listed for convenience:

<u>U.S. Patent Number</u>	<u>Inventor(s)</u>
5,173,819	Takahashi et al.
5,414,591	Kimura et al.
6,583,989	Guyer et al.
6,742,068	Gallagher et al.
<u>Publication Pat. App.</u>	<u>Inventor(s)</u>
2003/0053293	Beitelmal et al.

Non-Patent Documents

Author(s)

Service Manual CP80-12

RadiSys

Discussion of References:

U.S. Patent No. 5,173,819 to **Takahashi** et al. discloses a disk apparatus having a specific internal arrangement of its electronic units. FIG. 1 illustrates the disk apparatus having a frame 9 provided with five shelves for mounting of the electronic units and two power sources 101, 102 disposed on the uppermost shelf of the frame 9. See col. 5, ln. 14-19. The remaining four shelves each allow two head-disk units HDUs 12 to be mounted thereon. See col. 4, ln. 30-33. FIG. 10 illustrates the disk apparatus 40 having an output of the controller power source 44 connected to a controller electronic circuit section 34, and a channel interface 47. See col. 9, ln. 42-60. The HDUs 12 are positioned vertically thus allowing air to flow within a passage from a lower portion of the disk apparatus. See col. 8, line 62-col. 9, ln. 15. FIG. 6 illustrates the disk apparatus having cooling air sent through the inside of the tunnel-shaped first chamber thereby cooling the HDUs. See col. 6, ln. 57-63. **Takahashi** simply does not provide "a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10" as recited in claims 1-3 and 10. In addition, **Takahashi** does not have any display or keyboard constituting a computer such that **Takahashi** does not provide any computer 14 for outputting said management information managed by said processor for management 13 that is either (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); or (2) rotatably arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

U.S. Patent No. 5,414,591 to **Kimura** et al. discloses a disk array storage system. FIG. 1 illustrates disk units 31a arranged in four rows and piled in five layers. See col. 4, ln. 13-14. Also show in FIG. 1 is a door 38, an inlet 39 for cooling air, and an outlet 40. See

col. 4, ln. 15-20. The power source, and control circuits 42 are cooled by cooling air 41. Cooling air flows into the system through the door 38 and the cooling air inlet 39, moves upwardly through the casing 9, and is distributed to the disk units 31a by respective blower fans 13. See col. 4, ln. 26-30. FIG. 6 illustrates partitions 10, for partitioning the disk units 31b, having openings 14 through which cooling air 41 can be passed. See col. 5, ln. 45-54. **Kimura** simply does not provide “a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10” as recited in claims 1-3 and 10. In addition, **Kimura** does not have any display or keyboard constituting a computer such that **Kimura** does not provide any computer 14 for output said management information managed by said processor for management 13 that is either (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); or (2) rotatably arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

U.S. Patent Number 6,583,989 to **Guyer** et al. discloses a computer system for managing a computer network comprising a rack cabinet including a rack manager. FIG. 3 illustrates the rack including a rack manager 43, a video device 44, an input/output (I/O) device 46 for a computer system 11. See col. 17, ln. 26-35. There are compute elements 29, a bracket 31-2, a frame 15, a distributed power bay 50, a power supply 187, and hot-swappable distributed power supplies 187. See col. 16, ln. 18-26. FIG. 6 illustrates a rack cabinet 13 housing, a fibre channel switch 51, the computer system 11 and main storage devices 53. Main storage devices may comprise a RAID. See col. 18, ln. 52-63. **Guyer** relates to a system with a centrally located user-interface internal devices within the rack manager 43 positioned to increase the amount of free space in individual compute elements 29. However, as shown in Fig. 6, **Guyer**’s rack manager 43 and compute elements 29 (e.g., 1-U, 2-U...) are connected to the fibre channel switch 51 which is then connected to the storage device 53 such that its processor is connected to the fibre channel switch 51, rather than plural disk adapter boards in the storage devices 53, etc. As such, **Guyer** does not provide “a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter

boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10” as recited in claims 1-3 and 10. In addition, **Guyer’s** rack manager 43 (Fig. 2) is neither (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); nor (2) rotatably arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

U.S. Patent No. 6,742,068 to **Gallagher** et al. discloses a cabinet for storing a plurality of disk arrays. Fig. 1 illustrates a data server 10 (within a single cabinet 18) coupled between a storage system 12 and a network 14 (FIGS. 2, 3A-E, and 4B; col. 4, ln. 66-col. 5, ln. 6). FIGS. 4A and 4B illustrate the data server 10 having a front door 36, a keyboard 34 mounted to the door, a display 32, and control stations 22₁, 22₂ including a hard drive and AC-DC converters 38. See col. 6 ln. 1-3. The control stations 22₁, 22₂ share the common display 32, the keyboard 34, the mouse, and CDROM 50. See col. 7 ln. 10-15. The cabinet 18 houses the control stations 22₁, 22₂ each including a floppy disk 60 and an optional hard drive 62. See col. 6, ln. 61-66. However, the processors 22₁, 22₂ and processing unit modules 18 in the data movers 20 (col. 5, lines 8-12) of **Gallagher’s** disk array system are arranged in the cabinet and connected to the FWD SCSI or fiber channel interconnect 16 (Fig. 1; col. 6, lines 52 -60) such that they are not connected to plural disk adapter boards in the storage system 12. As such, **Gallagher** does not provide “a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10” as recited in claims 1-3 and 10. In addition, only **Gallagher’s** keyboard 34 (but not the display 32) shared by the control stations 22₁, 22₂ is rotatably arranged on the rear face side of a front door (Fig. 2), and **Gallagher’s** keyboard 34 is rotated and utilized with respect to said front door in the “close” (rather than “opening”) state of said front door when said management information is outputted and utilized. As such, **Gallagher’s** computer is neither (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); nor (2) rotatably

arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

U.S. Pub. No. 2003/0053293 to **Beitelmal** et al. discloses a method and system for cooling heat generating components of a rack storage system. FIGS. 1 and 2 illustrate a rack system 10 having blowers 14 in fluid communication with a plenum 16 wherein blowers 14 are situated to deliver cooling fluid to plena 16, 30 located on both sides of the enclosure 12. See section [0023]. The rack system 10 includes five subsystems 20 and associated components 22, 48. See section [0025]. The components 22 may include microprocessors wherein the components 48 may comprise memory devices and ASICS. See section [0029]. However, as shown in Fig. 2, **Beitelmal**'s components 22 (may include microprocessors) and components 48 (may comprise memory devices) are not directly connected with each other such that any microprocessors of the components 22 are not be connected to any memory devices of the components 48 or any disk adapter boards (if available) therein. As such, **Beitelmal** does not provide "a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10" as recited in claims 1-3 and 10. In addition, **Beitelmal** does not have any display or keyboard constituting a computer (Fig. 2) such that **Beitelmal** does not provide any computer that is either (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); or (2) rotatably arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

Service Manual **CP80-12** to RadiSys describes 12-U tall rack mountable NEBS/ETSI compliant chassis known as the CP80-12. Described is a storage media rack stand having optional features such as fan module, temperature sensors, display module to convey messages, and alarms sent by the Platform Management system, see pg. 2. FIG. 5 shows the path that cooling air may take when components are installed. See pg. 10. **CP80-12** simply does not provide "a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9

and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10” as recited in claims 1-3 and 10. In addition, **CP80-12** does not have any keyboard constituting a computer such that **CP80-12** does not provide computer 14 for output said management information managed by said processor for management 13 that is either (1) pulled out of said disk array box body and further rotated and utilized when said management information is outputted and utilized (claims 1 and 3); or (2) rotatably arranged on the rear face side of a front door and rotated and utilized with respect to said front door in the opening state of said front door 32 when said management information is outputted and utilized (claims 2 and 10).

Conclusion

Based on the results of the comprehensive prior art search as discussed above, Applicants contend that the disk array device as recited in independent claims 1- 3 and 10, especially the features of “a processor for management 13 constructed by a PC for industry (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10” and “a computer for output 14 used to output said management information managed by said processor for management 13”. In particular, the computer 14 for output is either (1) pulled out of said disk array box body (e.g., Fig. 6) and is further rotated (e.g., Fig. 7) and utilized (e.g., Fig. 8) when said management information is outputted and utilized (claims 1 and 3); or (2) rotatably arranged on the rear face side of said front door and is rotated and utilized with respect to said front door 32 in the opening state of said front door 32 (Fig. 12) when said management information is outputted and utilized (claims 2 and 10).

The disk array device 1 of the invention (for example, the embodiment shown in Figs. 1-3) comprises: a disk array box body 2 for arranging a box body therein; a disk drive box body 4 in which plural disk drives 5 for storing data are spaced at intervals for ventilation and are arranged in a matrix shape; a controller box body 6 constructed by arranging plural disk adapter boards 8 for controlling the writing or reading operation of data with respect to the plural disk drives 5 within said disk drive box body 4, plural host adapter boards 9 connected

to a host device 12 and receiving data from said host device 12, and plural memory boards 10 for storing data and control information written or read from said host adapter board 9 and said disk adapter board 8, such that said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 are spaced and arranged at intervals for ventilation; a processor for management 13 constructed by a “PC for industry” (p. 13, 3rd paragraph) connected to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and collecting and managing management information relating to said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10; a computer for output 14 (“arranged separately from the processor 13 for management” p. 14, 1st paragraph) used to output said management information managed by said processor for management 13; a fan for exhaust 15 for exhausting a ventilating wind flowed via the interior of said controller box body 6 and a ventilating wind flowed via the interior of said disk drive box body 4 to the exterior of said disk array box body 2; and a power source device 16 for supplying electric power to the plural disk drives 5 within said disk drive box body 4, said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, said processor for management 13, said computer 14 for output and said fan for exhaust 15.

As further recited in claims 3 and 10, the disk array box body 2 is constructed such that said processor for management 13 and said computer 14 for output are arranged in positions for preventing no flow of a ventilating wind within said disk drive box body 4. In addition, As recited in claim 3, the computer 14 for output is pulled out of said disk array box body (e.g., Fig. 6) and is further rotated (e.g., Fig. 7) and utilized (e.g., Fig. 8) when said management information is outputted and utilized. As recited in claim 10, the disk array device further includes a front door 32 (for example, the embodiment depicted in Fig. 12) attached to the front face side of said disk array box body 2 and opening and closing said disk array box body 2. The computer for output 14 (e.g., Fig. 12) is rotatably arranged on the rear face side of said front door and is rotated and utilized with respect to said front door 32 in the opening state of said front door 32 when said management information is outputted and utilized.

The embodiment recited in claim 2 includes all elements of claim 10 except “the disk array box body 2 is constructed such that said processor for management 13 and said computer 14 for output are arranged in positions for preventing no flow of a ventilating wind

within said disk drive box body 4". Instead, the embodiment recited in claim 2 further recites that disk array box body 2 is constructed by a first disk array box body 2A for arranging said controller box body 6 and said power source device 16, and a second disk array box body 2B for arranging said disk drive box body 4 (e.g., Fig. 12). The first disk array box body 2A is constructed such that said controller box body 6 is arranged above said power source device 16, that the processor for management 13 is arranged on the side face of said controller box body 6 so as not to prevent the intervals for ventilation between said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, that the computer for output 14 is rotatably arranged on the rear face side of said front door 7 so as not to prevent the intervals for ventilation between said plural disk adapter boards 8, said plural host adapter boards 9 and said plural memory boards 10 within said controller box body 6, and that the fan 15 for exhaust is arranged above said controller box body 6. The second disk array box body 4B is constructed such that said fan 15 for exhaust is arranged above said disk drive box body 4. The computer for output 14 is rotated and utilized with respect to said front door in the opening state of said front door 7 when said management information is outputted and utilized.

The embodiment recited in claim 1 includes all elements of claim 3 except "the disk array box body 2 is constructed such that said processor for management 13 and said computer 14 for output are arranged in positions for preventing no flow of a ventilating wind within said disk drive box body 4". Instead, the embodiment recited in claim 1 further includes a second disk drive box body 4B in which plural disk drives 5 for storing data are spaced at intervals for ventilation and are arranged in a matrix shape. The embodiment recited in claim 1 (e.g., Fig. 4) further recited that the disk array box body 2 is constructed such that said controller box body 6 is arranged above said power source device 16 through a ventilation interrupting plate 17 for preventing the ventilating wind from said power source device 16, that the first disk drive box body 4A and said second disk drive box body 4B are arranged above said controller box body 6 by interposing a flow path for passing the ventilating wind flowed via the interior of said controller box body 6 between said first disk drive box body 4A and said second disk drive box body 4B, that the processor for management 13 is arranged on the side face of said first disk drive box body 4A so as not to prevent the intervals for ventilation between the plural disk drives 5 within said first disk drive box body 4A, that the computer for output 13 is arranged on the side face of said second disk drive box body 4B so as to be pulled out such that no intervals for ventilation

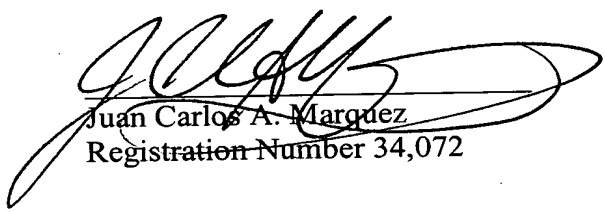
between the plural disk drives 5 within said second disk drive box body 4B are prevented, and that the fan for exhaust 15 is arranged above said first disk drive box body 4A and said second disk drive box body 4B.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable consideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and telephone number indicated below.

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